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ABSTRACT

Although 17 studies of attitude change among economics students in American secondary schools and colleges had been conducted by 1981, analysis of this research indicates that such studies are still in their infancy. Numbers of students participating in these studies ranged from 922 in 27 classes in Sewell's (1963) study of attitude change among secondary school economics students to the 66 students in a single college-level microeconomics class in Thompson's (1973) study. Three different kinds of attitude change were measured in these studies: (1) attitudes toward the subject itself; (2) movement of attitudes toward those held by professional economists; and (3) change in political attitudes along the liberal-radical/conservative continuum. Difficulties were found in many of the measures and the research designs used in these projects. These difficulties included the use of non-random samples and problems with such standardized tests as the Test of Economic Understanding. A particular problem noted was the short time period, usually a semester, in which attitude change was measured. The principal benefit of this research is as a source of hypotheses for further testing. (IS)

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Research on Attitude Change in Economics Students

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Research on Attitude Change in Economics Students

By 1981, there had been some seventeen investigations on the subject of attitude change in economics students at secondary school or college. This literature review describes and critically analyses these studies, all of which are American in origin. It is organised chronologically, since in a number of cases research workers elaborated instruments, methods and hypotheses developed in earlier projects. Particular attention is paid to research methods used.

In a review of research in economic education published in 1971, the authors stated: 'attempts to assess the extent to which instruction in economics (or the instructor in economics) changes student opinion (attitudes or values) on controversial issues are still in their infancy.' (Lewis and Orvis, 1971, p10). Despite a considerable number of research projects in the decade following that judgement, it was still apposite in 1981.

Probably the first study attempting to associate attitude change with economics learning was that by Sewell, who measured the effect of class work in economics on the attitudes and understanding of a select group of secondary school pupils (Sewell, 1963). Sewell developed his own instruments to evaluate economic knowledge and liberal/conservative attitudes.* These two instruments were designed to answer the following questions:

1. How well do high school students understand the principles of economics?
2. Are they liberal or conservative?
3. What effect does an increased understanding of economics have on their attitudes? (Sewell, 1963, p131).

*When discussing American literature, the expression 'liberal/conservative' is used since this is how the continuum is described in the U.S.; for U.K. work, 'radical' is substituted for 'liberal'.

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Sewell's study involved 922 students in 27 classes, 11 schools and 8 states from which he received usable responses. However, the students comprising this sample were not randomly selected, and the results could only be applied to the particular population defined in the study and could not necessarily be applied to other high school students in other locations.

Sewell used the principle of summated ratings in his construction of the attitude scale. First, he developed one hundred statements ranging from 'liberal' to 'conservative'. Eight judges, including members of the University of Texas faculty and several graduate students, were asked to label each statement as being 'liberal', 'conservative' or 'uncertain'. Sewell then selected those statements upon which there was 'as much agreement as possible'. (Sewell, 1963, p107). Sewell himself admitted that the judges showed considerable disagreement amongst themselves as to the proper classification of the statements. He had given no definition of the terms 'liberal' and 'conservative' to the judges, who may consequently have interpreted them differently. (Only sixteen years later did the first definition of these terms appear in the literature.) (Luker, 1979). Moreover, it might well have been the case that many of the statements were so framed that conflicting reactions were perfectly possible. It cannot therefore be concluded that the validity of this instrument was adequately established. However, Sewell proceeded to administer it to high school students, both as a pre- and a post-test.

A select list of Sewell's findings included the following:

1. There was a statistically significant but slight positive correlation between better understanding in economics and a more conservative attitude for students participating in the study.

2. Boys were slightly more conservative in economic matters than girls, and scored more highly in understanding.

3. Attitudes could be measured and changed. The test in this study did measure conservative and liberal attitudes and understanding of important economic principles.

However, given the doubts expressed concerning the validity of the instrument; and the fact that the finding showed only a slight relationship, it must be regarded as extremely tentative. The same conclusion holds for the second finding: its status is simply as an exploratory hypothesis, requiring further investigation. Sewell's third conclusion was perhaps rather overconfidently asserted. Nevertheless, as a preliminary foray into an extremely complex field, Sewell did demonstrate a number of problems and pitfalls to be avoided by subsequent researchers.

The next major study dealing with economic attitudes was published in 1964. (Paul, 1964). In the 1960s and 1970s, a number of standardised instruments were developed for measuring gain in economic understanding, among them the Test of Understanding in College Economics (TUCE), the Test of Economic Understanding (TEU) and the Test of Economic Literacy (TEL). These instruments, whose development was sponsored by the Joint Council on Economic Education, were frequently used as research tools, as will become apparent from this review of the literature. Paul made one of the first attempts to link cognitive gain, as measured by one of the above tests, and economic attitudes. The variables Paul related to economic understanding were: socio-economic level; sex; IQ; type of school; grade in social studies; number of social studies courses; number of business courses; grade in business courses; course of study; liberal or conservative; total score on test; participation in a course of economics. (Paul, 1964, p5).

The sample included 720 students from six high schools representing six different types of communities. A 'Survey of Opinion on Selected Economic Issues', developed by the Alabama Business Research Council, was used to determine whether the students agreed, disagreed or had no opinion concerning the 63 statements comprising the survey. The main purpose of this instrument was to test whether or not students developed definite opinions concerning economic concepts. As part of this instrument the respondent was to indicate on a 5-point scale how he would describe himself with respect to liberalism/conservatism.

The main conclusion of Paul's research

was that those students who indicated that they were either liberal or conservative (definitely committed but not extreme) scored more highly in economic understanding (as measured by the TEU) than those students who showed more extreme commitment, less commitment, or no commitment at all.

One drawback of this study was that the students' self-rating as liberal/conservative was not externally validated in any way, hence the relationships subsequently found between such ratings and economic understanding should be regarded as highly speculative. Moreover, Paul did not examine the important question
whether increased economic knowledge tended to make students more radical or conservative. A common problem with these early studies was that few data were published on the origins, characteristics and reliability of the affective instruments used.

This criticism could be levelled at the next study, in which Dawson taught a course on Current Economic Problems at New York University between 1960 and 1963, and attempted to measure how students' attitudes towards organised labour changed as a result of his teaching. He attempted during the course to present all sides

of each issue in as objective a way as possible (Dawson, 1966). Over the four years of the project, 181 students participated in the surveys. A major finding was that 31 per cent of the students reported a change in attitude towards organised labour after having taken the course, the majority trend being towards greater sympathy for organised labour. The students were asked to indicate what had caused them to change their views, and most indicated that the greatest influence was the instructor's lectures. An interesting finding was that 44 per cent of the females changed their views, while only 19 per cent of the males changed theirs. Both changed mostly in the direction of union sympathy, but the change on the part of the females was 'much more radical'.

While these three research projects were rather unsophisticated in their design, they were nevertheless fertile in generating hypotheses for subsequent investigation. Sewell's work spawned a series of studies attempting to correlate economic understanding and position on a conservative/liberal attitude scale. A very large number of studies attempted to measure the impact of a variety of variables on cognitive gain in economics, using one of the standardised instruments measuring economic understanding as the dependent variable (or the difference between pre- and post-test scores). Paul's paper reported an early attempt, and as was so often to be the case, a question about attitudes was included almost as an afterthought, rather than as a principal hypothesis. Still, his work generated several hypotheses relating political judgements and economic attitudes. It may also have influenced subsequent work in which students' 'opinionation'* and/or dogmatism was tested and correlated with economic understanding and attitude change. Dawson's early investigation was, he admitted, rather simplistic in its design

*A word used in the literature, especially by M. Rokeach.

but he increased awareness of the practicability of ordinary classroom teachers embarking on minor research projects, and was one of the first researchers to find a distinction between the sexes with respect to economic education, in this case concerning attitude change, though subsequent studies were to highlight sexual disparities in economic understanding.

Several research projects evaluated changes in economic attitudes, not in terms of movement along a conservative/liberal continuum, but with respect to how closely students' attitudes correlated with those of professional economists. The latter's views were normally ascertained by asking them to respond to a variety of attitude statements, the researcher then incorporating into his instrument those items which displayed the maximum consensus amongst the economists.

In the first such study, the teachers of those classes which registered the highest and lowest gain in attitude sophistication as a result of an economics course were interviewed about their goals, methods of teaching and materials used. (Hemmer, 1969, pp66-67). Further consideration is given below to the relative merits of the two types of attitude scale, with particular reference to the work of Soper and Walstad (1981). Hemmer was principally interested in determining if increased knowledge of economics caused students' attitudes towards economic concepts to converge towards the consensus of economists. He made no analysis of the change in liberalism/conservatism among students.

Hemmer concluded that as cognitive and affective learning grew, the correlation between the cognitive and affective scores increased. In other words, as a student's knowledge and understanding of economic concepts increased, his attitudes became increasingly like those held by professional economists. It also appeared from his findings that

some attitudes were easier to change than others. He stated that in a one-semester course, (a very limited period of time), only the attitudes that were easiest to change could be altered. Further, Hemmer suggested that 'good' teachers could be identified by the gain registered between pre- and post-tests for their students on the attitude scale, and that one way of developing a teacher's teaching ability was through the creation of better attitudes in teachers. (Hemmer, 1969, pp149-150). Students' attitudes towards economic issues moved closer to those of professional economists, the larger and more varied the teacher's repertoire of techniques, the more involved the student in the learning process, and the greater the teacher emphasis upon developing the students' ability to analyse problems.

Also in 1969, Alexander published a study of the 'degree to which high school students in Alabama developed an understanding of the basic concepts of economic education.' (Alexander, 1969, p4). By using the concepts included in the questions on the 'Test of Economic Understanding', she constructed an opinion scale to determine how students 'felt about or applied their understandings as indicated on the TEU.' (Alexander, 1969, p5). The instrument was not designed to measure liberalism/conservatism, as was Sewell's attitude scale. Instead she framed it so that the student could indicate agreement, disagreement, or no opinion to each of the statements. Her sample included 134 high school seniors enrolled in a general class in economics in three schools in Alabama. She chose these schools to obtain a population representative of different socio-economic areas. However, the sample was not random and her findings could only be regarded as tentative hypotheses for subsequent more systematic research.

The findings of her study touching attitude questions were as follows:

1. Students indicated stronger responses to statements on the scale which were related to their experience than to statements about economic theory.

2. Boys showed stronger responses to attitude questions than did girls. Girls more often expressed no opinion.

3. Students expressed strong agreement (per cent response greater than 75) with statements concerning: necessity of savings; necessity of maintaining competition; reason for high salaries of football players; requirement that jobs should be open to the qualified without regard for union membership; the fundamental right to strike.

4. Strong disagreement (as indicated by response greater than 75 per cent) was expressed with the following statements: government should not control inflation; in normal times, there is very little competition; advertising should be abolished because it is misleading; continually increasing the federal debt does not matter because we just owe the money to ourselves. (Alexander, 1969, pp108-111).*

Of particular interest , was the finding that economic understanding, as measured by the Test of Economic Understanding, transferred to the attitude statements. Alexander demonstrated that for her particular sample, the economic content did affect attitudes, but as in Hemmer's study, this was with reference to 'attitude sophistication' rather than movement along a liberal/conservative continuum.

*This statement, concerning the Ricardian equivalence theorem, may be deemed more cognitive than attitudinal; it illustrates the subtle interlinking between concepts and value.

A similar study attempting to measure 'attitude sophistication' soon followed the reports of Hemmer and Alexander, and replicated several of their results. (Mann and Fusfield, 1970). This project examined instructors' behaviour in the classroom and the personality and achievement characteristics of college students as possible variables to explain changes in attitude sophistication.

A 14-item Questionnaire on Economic Attitudes was developed, using a five-point Likert Scale. Higher scores indicated more sophisticated responses.

An interesting feature of the project was the factor analysis of the student ratings of their instructors. The relationship between the instructor's scores on the factors and the average change in his students' attitude sophistication was tested, using multiple regression analysis. Although the coefficient of determination was rather low ($R^2 = .28$) several factors were positively related to attitude changes. These were the students' evaluations of the instructor's general teaching skill, the organisation and structure of the course, the value of the course, the quality of instructor feedback to students, and the handling of beliefs and value problems in class.

A problem with studies such as that by Mann and Fusfield was that they assumed that 'attitude sophistication' was a measurable concept which would be universally acceptable. By 'attitude sophistication' they meant 'the sense of becoming wordly-wise in the ways of the accepted values of an academic discipline': not a very rigorous or objective definition. As Rothman and Scott (1973) pointed out, this assumed that in answering their Questionnaire on Economic Attitudes, all competent economists would reach similar conclusions or opinions in spite of differing ideologies. They suggested that for example item 8 (large military expenditures are not necessary to keep the

United States' economy booming) would not be answered identically by a liberal and a Marxist economist. Mann and Fusfield might have more rigorously established the validity of their instrument purporting to measure economic 'sophistication' if they had pilot-tested it with groups of professional economists known to possess widely differing views. Nevertheless, Soper and Walstad (1981) defended the validity of Mann and Fusfield's approach, as is reported below. A novel element was introduced by Luker and reported in an unpublished paper (Luker, 1970, p67). His research was designed to examine whether there was any relationship between economic knowledge as measured by the Test of Understanding in College Economics and 'dogmatism' as measured by the Rokeach Scale. (Rokeach, 1960). He also investigated the relationship between economic knowledge and conservatism as measured by the Rokeach Opinionation Scale.

Pre- and post-test data were collected from the 306 students enrolled at North Texas State University in the 'Introduction to Economic Principles' course during the Spring 1970 semester. Employing multiple linear regression techniques, his analysis yielded the following conclusions:

1. there was no relationship between knowledge of economics and dogmatism.

2. there was no relationship between knowledge of economics and opinionation.

3. there was a <u>positive</u> relationship between economic knowledge and conservatism.

A more detailed report of Luker's research was published in 1972. (Luker, 1972, pp13-22). However, no details of his liberalism/ conservatism test were provided, except that it measured 'general socio-political-religious conservatism' (p16), that its content was specifically independent of economics, and that it was developed as part of the study. Separating the microeconomics and macroeconomics courses, Luker was able to show that two non-hypothesised relationships emerged:

1. a positive relationship between decreased dogmatism and the macroeconomic course.

2. a positive relationship between increased dogmatism and the microeconomics course.

His third conclusion was also modified in this subsequent paper, in which he rejected the hypothesis of a positive relationship between increased economic knowledge and an increase in conservatism, but stated that a positive covariation could be discerned between an increase in liberalism and the macroeconomics course and an increase in conservatism and the microeconomics course. (Luker, 1972, p21). He also took the view that 'researchers interested in variables affecting cognitive performance probably should consider dogmatism as an important control device if classical experimental controls are not available.' (ibid., p21).

However, as with a number of the other American studies covered in this review, Luker's research did have the drawback that his findings only applied to the sample he studied and could not be generalised. The research was quasi-experimental, effected without the development of a random sampling design, and experimental and control groups. An important feature of his findings

is whether attitudes to economic issues might change as a result of exposure to an economics course, but not in a consistent direction,

assuming a unidimensional scale. In his study, the 'liberal' bias of macroeconomics was balanced by the 'conservative' bias of microeconomics, so that no observable change in the overall score was recorded. Nevertheless, scrutiny of the responses in more detail might indicate substantial shifts of view, implying that attitudes to economic issues might have a number of dimensions.

The next major study investigated the association between economic understanding, dogmatism, liberalism/conservatism and other affective elements for economics students in certain Texas schools. (Wood, 1972).

The main thrust of Wood's work was to ascertain if economic knowledge made a student more liberal or conservative, and more open-minded or more dogmatic. He also investigated whether any prior biases had any effect on gains in economic knowledge, and whether teachers had any effect in this respect.

He administered the Test of Economic Understanding (TEU), Rokeach's Dogmatism and Opinionation Scales, and Hollinghead's Two-Factor Index of Social Position to several hundred seniors studying economics in four Amarillo, Texas public high schools. No information was provided about how this sample was chosen. It was probably not random, but chosen for the researcher's convenience. The sample consisted of 696 students, 539 of whom completed all the test instruments (the sample was taught by seven different teachers in twenty economics classes). Wood noted that 'a good blend of ability, racial background, and socio-economic level was attained.' (Wood, 1974, p2).

Apart from the instruments already mentioned, Wood used the Illinois Course Evaluation Questionnaire, and a Questionnaire which he developed himself, which aimed to ascertain the students' average grades for all courses taken during the fall semester of the academic school year as a measure of past academic performance, and to provide occupational and educational data about the head of each student's household to be used with the Two-Factor Index of Social Position in determining each student's social position.

The Questionnaire was administered to the students at the beginning of the Spring 1972 semester and the Illinois Questionnaire at the end of the semester. The Two-Factor Index of Social Position score was computed from data on the Questionnaire. The other three instruments were administered as pre- and post-tests.

For analysing the data, Wood employed a t-test to determine if significant changes in knowledge of economics, dogmatism and opinionation occurred between the pre- and post-tests. Analysis of variance tests were used to determine if a significant difference existed, among the means, for change in knowledge of economics, dogmatism and opinionation depending on the teacher of the course. The overall means for each teacher were presented in control chart form, with the Moroney Technique used to identify those mean changes which diverged most from the grand mean. Simple correlation coefficients were then calculated, in an attempt to determine the degree of association between the various dependent and independent variables. Partial correlation coefficients were calculated to determine the degree of association of one dependent variable with an independent variable while other pertinent independent variables were held constant. (Wood, 1974, p3).

Analysis of the pre- and post-test data revealed that the 539 students evaluated registered an increase in knowledge of economics of +1.8 on the TEU as shown by the mean value for change (significant

at the .001 level). As a group, the post-test dogmatism scale mean for the 539 students was 12.68 less than the pre-test mean for the same group. Wood inferred that the students thus became more open-minded (significant at the .001 level).

As a group, the post-test opinionation mean was 1.53 less than the pre-test opinionation mean, indicating that the group became more liberal. However a t-test of the sample mean revealed that this change was not significant at the .01 level of significance.

By computing F ratios, Wood concluded that the particular teacher was a significant factor in the amount of gain in economic understanding demonstrated by the students (significant at the .01 level). Also at the same level of confidence, he found that the difference in the dogmatism score was significant depending on the teacher of the course. Further, the difference in mean change in opinionation was significant depending on who taught the students (significant at the .01 level).

Analysing the correlations between the variables, Wood suggested that several conclusions were warranted. He stated confidently that 'because of the size of the population tested and its statistical adequacy in respect to an infinite sample size at the .01 level of confidence, the conclusions drawn here should give general indications of the relationships between economic knowledge, the teacher and elements of the affective dimension for students of economics everywhere.' (Wood, 1974, p10).

However, Wood did not critically examine the instruments he deployed in his test battery. If they did not measure what they purported to measure, then any findings based upon mean changes should be treated cautiously. In particular, by using the Rokeach

Opinionation Scale, he was assuming unidimensionality of attitude with respect to the conservative/liberal continuum, an assumption which may be questioned. Also, as stated earlier, his sample was likely to be biased and could not be regarded as representative of economics students as a whole. In addition, no control groups were used.

Bearing these reservations in mind, a select list of relevant findings is as follows:

1. The students' knowledge of economics increased significantly during instruction.
2. This change was not highly correlated to the students' pre-test scores on the TEU, to their mean change on pre-test scores on the Opinionation or Dogmatism Scales, to their past academic performance, to their socio-economic grouping or to their overall course evaluation. Thus no variables considered in the study correlated with change in economics knowledge to the degree necessary for prediction of success in economics.
3. Analysis of variance and the Moroney Control Chart indicated that the teacher affected the amount of gain in knowledge of economics.
4. The students became significantly more open-minded between the pre- and post-tests of dogmatism.
5. This change in dogmatism was not significantly related to the students' change in knowledge of economics, his change in opinionation, his socio-economic group, his past academic performance, or his evaluation of the course.
6. By analysing the variance among the treatment group means for change in dogmatism, it was discovered that the change was related to the teacher of the course.
7. No significant change in opinionation (liberalism/conservatism) occurred during the semester of instruction in economics.

8. The change in opinionation that did occur was not significantly related to any of the variables studied except the teacher of the course. The change in opinionation was not related to the amount of content learned.

While Wood's results were produced with analytical rigour, several limitations in his research design meant that his conclusions could only be regarded as tentative, providing lines of possible enquiry for future researchers.

Following Luker's 1972 research report, in which he suggested that the Test of Economic Understanding might be biased towards conservative views, Rothman and Scott attempted to assess whether such bias might attach to the Test of Understanding in College Economics. (Rothman and Scott, 1973, p117). A great deal of evidence indicated that the TUCE was an adequate measure of economic knowledge. But a student's score on TUCE might also be a function of his political bias. They suggested that most political attitudes referred to goals such as the maintenance of full employment or price stability. Such attitudes depended heavily on the individual's perception of reality, and the more economics he learnt, the more likely he was to adopt a perception of reality consistent with economic theory. Thus knowledge of economics might change attitudes which appeared to be political.

This study of the relationship between political opinions and the TUCE was a by-product of a 1969 experiment to determine the effect of an introductory economics course on student attitudes. (Scott and Rothman, 1975). Before discussing the former paper, it would be appropriate to consider the latter's findings. The earlier research project had examined the effect on attitudes of a one-semester course. Scott and Rothman isolated a set of opinion questions and devised a scale which could be used to identify 'liberals' vis-à-vis 'conservatives'.

In Autumn, 1969, a 41-item social opinion questionnaire was given to roughly 175 (mainly sophomore) students at Carnegie-Mellon University, both at the beginning and at the end of the semester. Of the group, 130 were in an introductory economics course. The course included both micro and macro elements. The rest of the group were psychology students, and these were used as a control group in the determination of the effect of the introductory economics course.

Three hundred and ten usable questionnaires were obtained: 268 from economics students, 42 from psychology students; 170 from the pre-test, 140 from the post-test. From that group there were matched responses from the beginning and end of the semester for 91 economics students and 19 psychology students.

The questionnaire was constructed specifically for this study to provide an appropriate instrument for the population. It contained statements on a wide variety of topics, including attitudes to sex, nationalism and crime, as well as economic issues. A five-point Likert type scale from 'strongly agree' to 'strongly disagree' was used for the responses. Scott and Rothman treated this ordinal scale as though it were cardinal. (Implying that students could not only be ranked along the continuum, but that distances between scale scores were equal and measurable).

Only the responses to statements on economic issues were included in their analysis, (17 statements in all), which employed two multivariate statistical techniques (principal components analysis and cluster analysis) in an attempt to discover that set of questions and associated weights which would best separate the students along a 'liberal/conservative' dimension.

The test-re-test correlation for the scale was .81. Scores on the scale correlated most highly (.42) with the students' self-evaluation of their conservatism or liberalism although such self-evaluations were not used in devising the scales.

The questionnaire also requested background information about each student, including age, sex, year in school, SAT score, and some information on his field of specialisation.

The results of their analysis showed that over the course of the semester, the total sample revealed a slight, statistically insignificant, liberal shift.

The mean opinion scale score fell from 8.15 to 7.55 (σ = 4.59). (The higher the score, the more conservative). Insignificant liberal shifts were found separately for economics students and for the psychology students. Scott and Rothman commented that if there were significant factors at work, they appeared to be offsetting one another.

Multiple regression analysis, using student opinion scale scores as the dependent variable, indicated that all the independent variables were significant, though the R_2 was low. They suggested the following conclusion. First, ceteris paribus, the older the student, the more conservative he was likely to be. Second, the college experience was a liberalising one. Third, economics students and students with higher TUCE scores tended to be more conservative.

In order to focus more sharply on the issue of whether economics did affect attitudes, a second regression was run, using only the 110 pairs of matched responses for which completed questionnaires were available from both the beginning and the end of the semester. Initial opinion was controlled by the inclusion of both initial opinion score and initial self-evaluation. Both of these variables were highly significant. Age was again significant - the older the student, the more conservative. Gender, which was significant at the 20 per cent level, implied that females were more liberalised by the college environment than were males. This parallelled the earlier finding reported above (Dawson, 1966, p203) in which the female change in

direction towards a more sympathetic and liberal attitude to trade unionism was 'much more radical' than the change by males.

Scott and Rothman also compared the relative changes in attitudes of psychology and economics students. The score on the opinion scale for the students' psychology instructor minus the students' initial score was taken. This variable, which was zero for economics students, measured for a psychology student the 'distance' between his attitudes and those of his instructor. The sign of its regression coefficient indicated that the students moved towards their instructors' views. But, more important, since the psychology instructors were generally more liberal than their students (the mean of this variable was -1.5), the variable was quite similar to one that equalled zero for economics students and -1 for psychology students. In fact, the correlation between the two variables was .82. The statistically significant (.001) positive coefficient for the variable indicated that relative to psychology, introductory economics tended to make students more conservative, or alternatively, relative to economics, introductory psychology tended to make students more liberal with respect to economic issues.

Scott and Rothman's major conclusion was that, relative to the introductory psychology course, the introductory economics course tended to make students more conservative. Although this effect was highly significant statistically, students overall became slightly more liberal. But the sample size was not large and the control group was specialised.

Reverting to the incidental research on the relationship between the TUCE score and attitude change, Rothman and Scott took 49 students from the 1969 sample (no indication was provided about how these 49 were selected from the 91 economics students for whom data were available), and gave them as a pre- and post-test the Questionnaire

(attitude scale) devised by the researchers and the TUCE form 1B as pre-test and TUCE form 1A as post-test. The TUCE score was regressed on each of the opinion scales. On the pre-test, conservative students answered more TUCE questions correctly than did liberals. At the end of the semester however, there was no statistically significant relationship between opinion scores and TUCE scores. They inferred from the first result that untrained conservatives possibly knew more about market systems than did untrained liberals. They provided two explanations for this phenomenon. First, since one was more likely to remember information one agreed with, conservatives would be more likely to be knowledgeable about the market system (than liberals) since they preferred such a system. Second, it might be that student conservatism was a reflection of parental conservatism. Conservative parents might be more likely to hold positions of responsibility in market institutions, and therefore they might be more likely and able to instruct their children in the workings of the market system. On the second result, Rothman and Scott inferred that the lack of a significant relationship after the course indicated that the opinion scale and the TUCE could diverge: they did not measure the same attributes. At least, the attitude scale was thought to measure something other than economic knowledge, but not to be totally independent of such knowledge. They concluded that the TUCE exhibited no systematic bias in favour of either conservatives or liberals when used immediately after the college course.

Rothman and Scott stated in their 1973 paper that there were 25 'economics' questions (actually statements) on the questionnaire, whereas in the Appendix to the 1975 article, only 17 'economics' items are listed. Such discrepancies make interpretation difficult. The main significance of their research

was that it highlighted the need to measure economic understanding

at the pre- and post-test stages, and relate such understanding to initial attitude position and subsequent attitude change. As with most American research projects considered in this review, the time period between pre- and post-tests was one semester (four to five months), and it might be suggested that it would be surprising for attitudes to change significantly over such a short period of time. Also, this research concerned college rather than school students, and it might be the case that college students' attitudes were more 'fixed' than those of school students, less susceptible to influence, whether from a teaching programme or otherwise.

A contemporary study by Thompson also used the pre- and post-test design to evaluate whether learning about free trade affected students' attitudes towards the benefits of trade liberalization. (Thompson, 1973). He used a ten-item multiple choice test to measure cognitive change, and an attitude survey comprising 66 statements to assess changes in opinion. The statements were categorised as 'strong' or 'weak' and weighted accordingly. Thus a student strongly agreeing with a weak statement favouring free trade would get a score of five on that item, while strong agreement with a strong statement would bring a score of six. Otherwise, Thompson's 5-point scale was of the usual Likert type. The experimental group was a microeconomics class at a college in California and the control group was students in an introductory psychology class. Both groups were pre- and post-tested with both instruments. One innovative feature of Thompson's research design was that he administered the attitude scale on a post-test basis only to another small group of economics students. He did this in order to control for any possible 'sensitizing' that the pre-test might cause. Finally, he also tested a class of graduate students at the University of California.

Each pair made the same point, but in a somewhat different manner. The fact that many inconsistent replies were noted suggested that the students had not given much thought to the statements or knew so little about the subject that intelligent responses were impossible.

Despite the extremely small non-random sample, and the use of tests which did not appear to have been subjected to rigorous examination, Thompson characteristically noted with optimism that 'our efforts do have an effect on the way students view the world.' (Thompson, 1973, p115).

Though this study had several shortcomings, its value lay in highlighting the possibility of the Hawthorne effect causing changes in the experimental group, and in emphasising the need to control for this by post-testing but not pre-testing another sample of economics students. If their mean score on the attitude scale were significantly different at the post-test to those of the experimental group, then it might be possible to infer that the consciousness of the experimental group that they were participating in a research project on the question of attitude change in economics students had itself affected their attitudes.

The other instructive aspect of Thompson's research was the attempt he made to assess the value of the control group's responses by testing for consistency. However, such consistency tests become almost impossible unless it has already been established that the scale is unidimensional. If it is not, then what may appear initially to be inconsistent responses may in fact be justifiably different responses to different implicit factors in the scale.

The next study of attitude change in economics students was on a much larger scale, and conceived in a more sophisticated way. (Riddle, 1977, 1978). Riddle attributed the paucity of research on attitude change to the lack of suitable measuring instruments. To overcome

this problem, he devised his own attitude scale, and then proceeded to apply it to particular groups.

He began by compiling an initial pool of 160 items on trade unions, economic organisations and power structures, socialism and social welfare, economic freedom, employment and inflation. Riddle was the first researcher systematically to build multidimensionality into his scale in this way, rather than offering an assortment of statements on economic issues and hoping that they all involved different expressions of the same attitude dimension. He then developed a four-point Likert scale. Unusually, Riddle provided no middle value for 'undecided', so that respondents were forced to decide whether they agreed or disagreed with the statements. This might have adversely affected the motivation of students who wished to register more equivocal responses to particular items.

The draft instrument was submitted to four professors 'familiar with the field of economics' and four professors of English. Each of these eight instructors submitted a list of those fifteen statements which in their opinion were the 'best' pertaining to each of the five economic issues. (Riddle, 1977, p5). Riddle then combined these eight opinions with his own judgement to develop an instrument consisting of approximately seventy-five items - fifteen items for each of the five economic issues. Riddle stated that this procedure was designed to establish face validity.

Next, Riddle administered the test to about one hundred students enrolled in a community college, none of whom had studied economics. Their responses were factor analysed into five groupings or scales, each of which comprised statements designed to measure opinions towards the five issues stated above. As a result, thirty five items were discarded because they would not correlate into the scales, leaving a total of forty items and five scales. The forty items were then randomized, to avoid a halo effect in responses, and some were

positively worded and others negatively worded. The negative items were scaled in reverse so that the scoring would take the same direction on all items. It was unfortunate that Riddle re-worded the items in this way subsequent to the pre-test, as the re-phrased items might have resulted in a different pattern of students' responses, thus affecting the inter-item correlations and the factor scales.

The Rokeach Dogmatism Scale was employed in a shortened version of twenty statements. According to the Appendix to Riddle's 1977 article, the twenty Rokeach statements were interpolated into the attitude scale so that the scale consisted of sixty items, forty of which measured attitudes to economic issues, and twenty dogmatism. However, he did not indicate how the twenty Rokeach items had been selected. Furthermore, the juxtaposition of the two quite different types of statement might well have affected students' responses to both, in that emotional responses to, for example, strongly worded dogmatic statements might have transferred to a subsequent statement on an economic issue. Riddle provided no justification for his administration of the two scales. The attitude scale was then administered to nearly 450 students in four community colleges in Virginia during one quarter, using the control group plus experimental group pre- and post-test design. The economics course itself represented the 'treatment' and the students enrolled in the course were considered the experimental group. Students not previously or currently enrolled in an economics course comprised the control group.

Eight student characteristics were ascertained by means of a questionnaire which was administered with the post-test. These were: degree of dogmatism (as measured by the Rokeach Scale), age, parents' education (considered a measure of socio-economic status), sex, college, grade in course, whether or not the student was a transfer, and marital status.

The computer program MANOVA was used in analysing these data. The criteria and covariates utilized were the five post-test and five pre-test economic attitude scores, respectively. Eight multivariate analyses of covariance comparing two factors simultaneously were performed. In each analysis, one of the factors, economics treatment scores, was crossed with a second factor. These second factors represented the eight student characteristic variables. Each analysis actually crossed economics and a student characteristic with respect to each of the five scales of the survey. This process was repeated for each of the eight student characteristics resulting in forty separate analyses. (Riddle, 1978, p112).

The aims of Riddle's study were as follows:

1. to determine whether or not enrolment in an economics course affected opinions towards economic issues.
2. to determine whether or not opinions towards the five economic issues varied according to the personal characteristics of the students and not to the treatment.
3. to determine whether or not there was an interaction between student characteristics and the effect of the treatment.

Economics treatment scores were compared with each of the eight student characteristics to ascertain whether or not there was an interaction between the student characteristics and the treatment. For example, did enrolment in an economics course appear to affect the opinions of transfer students but not affect those of non-transfer students?

Riddle showed that pre-test economic attitude scores (covariate scores) were correlated positively with the post-test economic attitude scores (criterion scores); these correlations were found to be significant in all analyses at the .001 level. The multivariate levels of significance provided strong evidence that students' opinions towards

economic issues were affected as a result of instruction in a basic economics class. The treatment, economics, was significant at the .05 level on the scales which measured opinions towards labour unions, economic organisations and power structures, socialism and social welfare, and economic freedom.

The specific direction of changes in opinion for students enrolled on the economics course were as follows:

1. Students became more favourably disposed towards labour unions as a result of the economics course
2. Students became more opposed to (or at least tended to question more) economic organisations and power structures
3. Students became less in agreement with socialism and social welfare
4. Students became more in favour of economic freedom
5. Students did not change their opinions concerning inflation and employment. The economics treatment was not significant on a univariate basis for scale five.

There were significant (.05 level) relationships between certain student characteristics and opinions concerning economic issues. These relationships were not related to the treatment and were as follows:

1. Students from urban colleges were more suspicious of economic organisations and power structures than students from rural colleges.
2. Rural students expressed more favourable opinions concerning economic freedom than did urban students.
3. Urban students had more favourable opinions about socialism and social welfare than did rural students.
4. Single students, regardless of college location, were more in favour of socialism and social welfare than were married students.

5. Highly dogmatic students expressed more emotionalism towards the issue of inflation and employment than did students with low dogmatism scores.

There was one significant interaction between the treatment, economics, and student characteristics. The independent variable, grade in course, had a multivariate level of significance of .03, indicating that enrolment in a basic course in economics affected students' opinions towards economic issues and that these opinion changes were related to the grade received in the course. This significance level seemed to arise chiefly from scale 1 which measured opinions towards unions. Riddle explained that students who earned the grades of A, B, D or F tended to adopt more favourable opinions towards trade unions while C students became more opposed to them. He did not mention how E students reacted.

Riddle made these conclusions:

1. In general, students seemed to adopt more conservative opinions as a result of the economics course. This conclusion was perhaps overstated in view of his finding with respect to students' attitudes towards trade unions.

2. Changes in opinions on economic issues were 'somewhat minimal'. The actual mean score differences were approximately 1.0 even though there were significant differences between treatment and control groups.

3. The study revealed that opinions on economic issues varied according to some student characteristics and were related to an introductory economics course.

4. The study indicated that significant changes in opinions towards trade unions were related to performance in the course. 'Average' students became less in favour of unions whereas 'poor' and 'good' students became more in favour of unions.

The main significance of Riddle's study, apart from certain techniques of data analysis study, lay in the procedures he adopted for developing his attitude scale. While no indication was provided of any reliability tests employed, his use of factor analysis in breaking down the scale into its component dimensions was original. A number of his conclusions provided hypotheses for further investigation in the present study. One was that there was a correlation between changes in students' opinions on economic issues and their enrolment in an economics course, another that an economics course had a tendency to shift students' attitudes in a 'conservative' direction. His use of the Rokeach Dogmatism Scale, while unsatisfactory, provided sufficient evidence, (coupled with that described above in Luker, 1970, 1972), of some correlation between scores on that test and attitudes to economic issues for the scale to be recommended for further testing.

In the 1970s a number of American states mandated the teaching of 'free enterprise economics' in high schools, with the specific intention of developing favourable attitudes towards the market economy. By 1976 sixteen states had made a course on 'the American free enterprise system' compulsory for high school graduation. (Holley and Skelton, 1980, p199). One study investigated the effectiveness of such a strategy. (McWilliams and Pinney, 1978).

The researchers administered an attitude questionnaire to nearly 400 students in high schools in the Southwest of the U.S.A. The instrument also included a short test of knowledge about the free enterprise system. After taking the pre-test, the students participated in a series of multi-media seminars on 'free enterprise economics'. Two weeks after completing the seminars the students took the post-tests.

The students were separated into two groups, on the basis of their economics test scores, Group A being those scoring above the mean, and

Group B those who scored below the mean. The mean attitude score of Group A was slightly above that of Group B, showing a more positive attitude towards free enterprise. This finding is consonant with earlier studies showing a correlation between cognitive gain and movement along a conservative/liberal continuum in a conservative direction. (The alpha equalled 0.20). Demographic factors however proved to be a more reliable predictor of attitude. The father's occupation, the family's economic status, and the parents' educational level were significant at the .05 level. Both groups registered positive shifts in attitude towards free enterprise, but these were small and not statistically significant.

The two groups were somewhat closer together in their attitudes on the post-test. McWilliams and Pinney concluded that instruction 'on the mechanism and benefits of the free enterprise system' resulted in some improvement in understanding but no statistically significant change in attitudes. They considered that attitudes might by 'firmly set' before students reached high school, and suggested that a very strong case could be made for beginning the economic education of children at the primary or middle school level. (McWilliams and Pinney, 1978, p128). This study was a rare example of researchers not only attempting to measure attitude change, but unblushingly suggesting that it was desirable that attitudes should be changed in a particular way.

Another 1978 study investigated the relationship between cognitive gain and attitude change. (Jackstadt and Grootaert, 1978). This research was carried out in 1977, when the Test of Economic Understanding was administered to over one thousand high school students in Hawaii. The students also responded to an Attitude Scale, which measured attitudes towards government intervention in the economy, profits, business, capitalism, and trade unions. The 30-item attitude instrument used a 5-point Likert scale, with 5 representing the most positive attitude towards the concept. The authors gave no information about

the provenance of the scale. Six items were provided for each of the 5 economic topics given above, and students' responses to the six items for each topic were averaged and used as variables in the regression analysis. A major aim of the investigation was to see if the attitudes registered were related to scores on the TEU at the pre-test stage, and if they affected the learning of economics as measured by the post-test TEU score.

Three attitude variables were found to be significant in the pre-test regressions. A positive attitude towards capitalism was associated with higher TEU scores, while positive attitudes towards government involvement and unions were associated with lower levels of TEU performance. Gender was also a factor, for the government variable was significant only for females and the union variable only for males. There was a negative correlation between attitudes towards capitalism and attitudes towards government and unions.

In the post-test regression, there was a positive coefficient for capitalism and profits. Positive attitudes towards unions and government were again associated with lower test results. The gender differences still existed. TEU gain scores were positively correlated with approval of capitalism and profits, whilst positive attitudes towards government and the unions did not seem to affect gain scores. An interesting finding was that attitude variables appeared to be more important in the 'female only' regressions, particularly as they related to gain scores. More variables were significant for females, and their coefficients were larger. The implication here might be that the males' ability to profit from an economics course in terms of achieving a more successful cognitive outcome was not so dependent upon having a 'positive' (conservative) attitude towards the topics listed in the attitude scale.

Unfortunately, insufficient information was available about the findings of this unpublished paper for detailed criticisms to be made. The attitude variables were omitted from the published versions of the study. (Jackstadt and Grootaert, 1980, p40 and Grootaert and Jackstadt, 1978, p12).

The same comment might be applied to Luker's paper on 'The Effect of an Introductory Course in Microeconomics on the Political Orientation of Students.' (Luker and Proctor, 1981), in which he followed up some of the hypotheses generated by his earlier studies, (Luker, 1970, 1972), and by Scott and Rothman (1975). His hypothesis in this project was that 'there will be significant difference in post-test mean scores on liberalism/conservatism for students in economics, sociology and psychology and that participation in a course in basic microeconomics will result in a greater increase in conservatism from pre- to post-test on the Rokeach Opinionation Scale than will participation in a comparable course in sociology and/or psychology.'

Luker examined the possible predictive ability of increased economic understanding as it related to students' liberalism or conservatism. He tested all students in the nine sections of a basic principles of economics course during Spring 1978 at North Texas State University. The students in nine sections of a basic sociology course and six sections of a basic psychology course comprised the control groups.

The mean post-test liberalism/conservatism scores served as the dependent variable, and the independent variables were mean pre-test liberalism/conservatism scores, political affiliation, self-evaluation of liberalism or conservatism, sex, social class, economic knowledge and major field of study. Multiple linear regression analyses were used to ascertain how each variable affected the liberalism/conservatism

of the students. An analysis of partial change regression was employed to eliminate pre-test differences between the groups so that they were assumed to be equal when all variables were partialled.

Luker found a significant difference between post-test mean scores for economics students as compared with the control groups, on the Opinionation Scale. Also, there was a significant increase in conservatism amongst students in the microeconomics course compared with the control groups. Luker's tentative suggestion that some correlation might exist between teachers' attitudes and changes in student attitudes warrants further investigation. In an earlier unpublished version of his paper, (Luker, 1979), Luker also provided the only definitions in the literature reviewed of the terms 'conservative' and 'liberal'. 'Conservatives' were defined as those who supported the status quo, resisted change in the existing political and economic power arrangements, saw labour as subordinate to management, wanted a minimum of government interference, and blamed outside influences rather than the existing structure for social problems. 'Liberals' sought progressive social change, criticized the status quo, wanted more power for labour and for government, saw social problems as symptoms of the underlying structure, and wanted to end poverty by attacking its social causes.

By the early 1980s, it was becoming apparent that too many localised instruments for measuring affective change were being developed, many of which lacked detailed published descriptions of how they were constructed, what characteristics they had, and relevant norming data. (Soper and Walstad, 1981). Nationally normed instruments had been available for measuring cognitive changes in economics for a number of years, and had been used extensively in research studies. But in the affective domain, ad hoc scales were normally employed. This applied both to scales measuring 'attitude sophistication' and to those measuring movement along a conservative/liberal continuum.

On the attitude scale pre-test, there was no difference between the means of the control and experimental groups. On the post-test, however, the economics students moved significantly towards approval of free trade, while the post-test score of the psychology class was almost unchanged (at a neutral position on both occasions). The mean scores for the economics students increased on both tests, and there was a 'fairly strong positive correlation between the two scores.' (Thompson, 1973, p114). He concluded that his hypothesis that an increase in knowledge would change attitudes did receive support.

He next compared the experimental group with the students who took the post-test but not the pre-test. He found a significant difference between their post-test scores (alpha level of .05). The post-test score for this special group was lower than the post-test score of the experimental group (although still higher than that of the control group). This result led Thompson to suggest that the pre-test might have sensitized the experimental students to the issue. However he did not explain why pre-test exposure should 'sensitize' students in a particular direction, namely towards acceptance of free trade. No great credence should be attached to this finding, in view of Thompson's subsequent comment that the non-experimental post-test group consisted of only 12 students, those who had not been present for the pre-test. It may well be that other factors accounted for the difference.

The graduate students showed most sympathy with the advantages of free trade, although their scores were not significantly different from the mean post-test score of the experimental group.

Another slightly unusual feature of Thompson's research design was that he attempted to ascertain whether the control group students really gave much thought to their answers. He selected three pairs of statements from the survey to check for consistency of response.

Twelve examples of such scales were provided in Dawson's conspectus of such work. (Dawson, 1980).

In order to introduce some uniformity into research concerning affective change, two instruments were developed in the U.S.A. between 1979 and 1981. (Soper and Walstad, 1981, Brenneke and Soper, 1980). They were developed under controlled conditions, were nationally normed and externally validated, and by 1981 had already been used in various research applications. However,

neither scale was an instrument measuring affective change along a conservative/liberal-radical continuum. Soper and Walstad's 'Survey on Economic Attitudes' had two dimensions, the first focussing on student attitudes towards economics as a discipline or subject of school study, the second quantifying the economic attitude sophistication of the student population.

On the second dimension,

it is germane to consider why Soper and Walstad decided to develop an economic attitude sophistication scale rather than one measuring affective change along the conservative/liberal continuum. They stated (Soper and Walstad, 1981, p3) that 'this part of the scale was to be designed so that relatively controversial politico-economic issues or problems could be addressed in a format more or less free from the theoretical propositions of economic science.' They held that the latter type of scale was of questionable validity given the problem of determining whether a particular response to an attitude statement represented a 'liberal' or a 'conservative' viewpoint. However,

it is quite possible to validate such items externally. If it were difficult to determine the appropriate response to a particular item, then that item should simply be rejected. A valid principle of measurement should not be jettisoned just because some of its manifestations are suspect.

Soper and Walstad proceeded to argue that it was not clear that professional economists as a group could be categorised as either liberal or conservative, making it arbitrary to identify a normative direction for attitude change. It is hard to see the relevance of this statement as an attack on the liberal/conservative type of scale. It is not disputed that economists would themselves be distributed along a liberal/conservative continuum. There is no implication to be derived from the use of such scales, that movement in one direction is to be preferred to movement in the other. Their use is to measure whether such movements do take place, and whether they are related to the study of economics and other variables.

Soper and Walstad were attracted to the Economics Attitude Sophistication type of scale, because of its allegedly 'positive' nature, in that it could be established which statements were answered similarly by the vast majority of professional economists, and students could then be judged to be moving (or not) towards those views held by the profession. However, consideration of the 'statements on economic issues' (p4) actually used might cause one to doubt the significance of the understanding of economics principles in the determination of an individual's responses. For example, item 13, 'most unemployed people are lazy', could equally well appear in a scale measuring liberalism/conservatism, and while one accepts that most economists would react similarly to this statement, this is not necessarily a valid judgement of that statement's validity or lack of it. Item 5, 'Free medical care should be provided for all Americans', is another example of where economics does not provide a simple answer, and political attitudes might dominate economic attitudes concerning the optimal allocation of resources. Item 10, 'People should not be told how to spend their money', is not obviously a statement on which economists have a point of view which distinguishes them from other sections of society.

The Economics Attitude Scale (EAS) was nationally normed in May, 1979, using students from sixty seven high school systems drawn from all geographic regions of the countr (N = 1747). The mean score on the EAS was 47.1. Subsequently the EAS was used as a pre- and post-test with undergraduates enrolled in a macroeconomic principles course at Northern Illinois University during Spring 1980. A most disturbing finding from this trial was that the pre- and post-test means were 35.8 and 35.8 respectively, considerably lower than those achieved by the high school students. Soper and Walstad provided a quite unsatisfactory explanation: 'the reason for these differences is not immediately obvious, but we might speculate and explain them in terms of a more "select" and "sophisticated" body of sophomores (with an attendant high degree of cynicism).' Surely one would expect the older, more economically literate students to register scores closer to those of professional economists?

Soper and Walstad proceeded to trial the EAS with yet another sample. After all, the perverse result obtained above would invalidate the scale. In the Fall 1980 semester, they sampled (N =46) more advanced economics undergraduates at Northern Illinois University, and with relief discovered their mean score to be 53.1. They also stated that further small-sample data from group of Northern Illinois University graduate students confirmed the tendency towards higher means as economics training proceeded.

The researchers stated that the EAS was not to be regarded as a list of 'right' opinions, nor was it designed to force students to adopt the consensus views of economists on economic issues. But they then proceeded to argue that the EAS simply assessed the degree or tendency of a student to hold opinions consistent with the current state of knowledge. Further they maintained that a high score on EAS might not, and probably should not, be an explicit outcome of a course or programme.

But surely, to develop those opinions which were consistent with the current state of knowledge should be regarded as at least a desirable outcome, in that the vast majority of economists hold them. Why should it not be an objective of a course for students to develop attitudes more like those of professional economists? In the present writer's view, while the principle of evaluating economics attitude sophistication would appear viable, a completely satisfactory instrument for measuring such affective attributes has yet to be devised. Soper and Walstad's case in favour of the EAS was not acceptable in all respects, and they did not provide adequate justification for their dismissal of alternative modes of affective assessment in their critique of liberalism/conservatism scales.

Conclusion

The main impression to be derived from this review of the literature was the extreme complexity of measuring attitude change in economics students. Three different kinds of attitude change were measured: attitudes towards the subject itself; movement of attitudes towards those held by professional economists; liberal-radical/conservative attitudes. Several studies concentrated on the last of these dimensions but most of the instruments used to measure such attitude change assumed unidimensionality unquestioningly, thus casting doubt on their validity, and the justification for the reported results.

Many of the studies were unsatisfactory in their research design. Frequently, non-random samples were selected, no control groups were set up, and results could not be generalised. The typical experiment involved the 'treatment' of a one-semester economics principles course, but rarely was any information provided about the content or objectives of such a course. It must be doubted whether substantial attitude

change could be observable after such a short period of time. Moreover, no attempts were made to assess whether any measured attitude changes persisted over time, for example over the six months following the end of the economics course. The impression was frequently gained that researchers were interested in other variables than attitudes, and that the attitude instrument was added to spice the experiment, without too much effort or ingenuity being devoted to its development. It was difficult to avoid the conclusion that after almost twenty years of research in this field, it was not possible to make any authoritative pronouncement about the various hypotheses concerning attitudes of economics students tested in the reported studies.

The principal benefit to be derived from the literature reviewed, is as a source of hypotheses, and in that respect it is extremely fruitful. Some of the main hypotheses deriving from these studies are as follows:

1. Increased understanding of economics is associated with a more conservative attitude to economic issues.
2. Attitudes to economic issues change as a result of exposure to an economics course.
3. 'Conservative' students increase their understanding of economic principles more than liberal-radical students.
4. Economics teachers influence their students' attitudes.
5. Female students show greater attitudinal change after an economics course than do male students.
6. Male students register more extreme responses to statements on economics issues than do female students.
7. Students who have been taught an economics course become more/less dogmatic depending on whether it is micro/macro in emphasis.
8. The older the student, the more conservative his attitudes to economic issues are likely to be.

REFERENCES

Alexander, 1969 — Alexander, Linda A. — An Analysis of Economic Understanding of High School Seniors in Selected Schools in Alabama. (Doctoral Dissertation, University of Alabama, 1969).

Brenneke, 1980 — Brenneke, J.S. and Soper, J.C. — Simultaneous Equations Estimation of Cognitive and Affective Changes in Economics Education. (Unpublished draft, presented at Midwest Economics Association Annual Meeting, Chicago, Illinois, March 27th 1980)

Dawson, 1966 — Dawson, G.G. — 'Changing Students' Attitudes' in Improving College and University Teaching, 14. Summer, 1966 pp. 200-203.

Dawson, 1980 — Dawson, G.G. — Attitudes and Opinions on Economic Issues. (Empire State College Center for Business and Economic Education. Research Report No. 2 1980).

Grootaert, 1978 — Grootaert, C. and Jackstadt, S.J. — 'Economic Education in Hawaii: A Historical Survey', in Educational Perspectives, Vol. 17, No. 2 May 1978. (Journal of the College of Education, University of Hawaii).

Hemmer, 1969 — Hemmer, W. — The Development of an Affective Scale and its Use in Comparing Affective and Cognitive Changes During 12th Grade Economics In-

		struction. (Doctoral Dissertation State University of New York, Albany, 1969. University Microfilms No. 70-1888
Holley, 1980	Holley, B.J. and Skelton, V.	Economics Education 14-16 (National Foundation for Educational Research 1980)
Jackstadt, 1978	Jackstadt, S.J. and Grootaert, C.	Sex, Attitudes, In-Service Training and Instructional Materials as Determinants of Economic Learning. (Honolulu: University of Hawaii Center for Economic Education, 1978 Unpublished paper.)
Jackstadt, 1980	Jackstadt, S.J. and Grootaert, C.	'Gender, Gender Stereotyping and Socio-Economic background as Determinants of Economic Knowledge and Learning'. (Journal of Economic Education Winter 1980, Vol.12 No. 1 pp 34-40)
Lewis, 1971	Lewis, D.R. and Orvis, C.C.	Research in Economic Education. A Review, Bibliography and Abstracts. (Joint Council on Economic Educatio 1971).
Luker, 1970	Luker, W.A.	The Relationship between Elements of the Affective Domain and Knowledge of Economic Concepts. (Unpublished paper, North Texas State University, 1970).
Luker, 1972	Luker, W.A.	'The Relationship between Economic Knowledge and Certain Elements of

the Affective Domain' in Research Papers in Economic Education. A.L. Welsh (Ed.) (New York, Joint Council on Economic Education, 1972).

Luker, 1979 — Luker, W.A. — The Effect of an Introductory Course in Microeconomics on Liberalism/Conservatism. (Denton: North Texas State University, 1979. 21pp. Unpublished paper).

Luker, 1981 — Luker, W.A. and Proctor, W. — 'The Effect of an Introductory Course in Microeconomics on the political orientation of students.' (Journal of Economic Education, Vol. 12, No. 2, Summer, 1981, pp. 54-57)

Mann, 1970 — Mann, W.R. and Fusfield, D.R. — 'Attitude Sophistication and Effective Teaching in Economics', 'Journal of Economic Education, Vol. 1, Spring, 1970, pp. 111-129)

McWilliams, 1978 — McWilliams, D.B. and Pinney, W.E. — 'Economic Education and Attitudes Toward the Free Enterprise System' (Journal of Economic Education, Vol. 9 No. 2 Spring 1978 pp.126-128

Paul, 1964 — Paul, J.H. — An Analysis of Economic Understanding in Selected Georgia High School (Doctoral dissertation, University of Georgia, 1964).

Riddle, 1977 — Riddle, T.L. — An Instrument for Measuring Student Opinions on Economic Issues. (Central Virginia Community College. Undated mimeo. Presented at the

Annual Meeting of the Virginia Association of Economists, Roanoke, April 15th, 1977).

Riddle, 1978 — Riddle, T. — 'Students' Opinions on Economic Issues: the effects of an Introductory Economics Course.' (Journal of Economic Education, Vol. 9, No. 2. Spring, 1978 pp. 111-114)

Rokeach, 1960 — Rokeach, M. — The Open and Closed Mind. (Basic Books, New York, 1960).

Rothman, 1973 — Rothman, M.P. and Scott, J.H. — 'Political Opinions and the T.U.C.E (Journal of Economic Education, Vol. 4, Spring 1973, pp. 116-124)

Scott, 1975 — Scott, J.H. and Rothman, M.P. — 'The Effect of an Introductory Economics Course on Student Political Attitudes'. (Journal of Eccnomic Education, Vol. 6 Spring, 1975 pp. 107-111)

Sewell, 1963 — Sewell, E.G. — 'Effect of Class Work in Economics on Attitudes and Understanding of a select group of Secondary School Pupils'. (Journal of Educational Research, 57, Nov. 1963 pp. 131-13

Soper, 1981 — Soper, M.C. and Walstad, W.B. — The Measurement of Economic Attitudes in High School and College. (Working Paper 78 in Economics, Northern Illinois University March 1981. ED 210218).

Thompson, 1973 Thompson, F.A. 'The Interaction of Cognition and Affect: The Issue of Free Trade.' 'Journal of Economic Education, Vol. 4, Spring 1973, pp. 111-115)

Wood, 1972 Wood, S.W. A Study of the Association between Economic Understanding, Dogmatism, Liberalism/Conservatism and other Affective Elements for Economics Students in the Amarillo Public Schools. (Unpublished doctoral thesis, Texas Tech University, 1972).

Wood, 1974 Wood, S.W. 'Effect of Content and Teacher on Student Economic Knowledge and Attitude'. (Delta Pi Epsilon Journal, 1974. Vol. 16 Pt. 2 pp. 1-11)